REMARKS

Claims 21 to 48 as set forth in Appendix II of this paper are now pending in this case. Claims 21 to 25, 27 to 37, 39 and 40, have been amended, and Claims 41 to 48 have been added as indicated in Appendix I of this paper.

Accordingly, applicants have revised the wording of Claims 21 and 33 to better bring out that the catalytically effective component of applicants' catalyst consists of the constituents (a) to (d) defined in the claim. Dependent Claims 22 to 25, 27 to 32, 34 to 37, 39 and 40 have been revised accordingly. Additionally, applicants' have added new Claims 41 to 48 which relate to the catalytically effective composition consisting of the constituents (a) to (d) referenced in Claim 21. New Claims 42 to 48 further specify the effective composition in a manner similar to the specification of the catalyst defined in Claims 22 and 27 to 32. No new matter has been added.

Claims 21 to 40 stand rejected under 35 U.S.C. §103(a) as being unpatentable in light of the teaching of ***Dewdney et al.*** in ***US 3,986,985*** ("**Dewdney (I)**") or in ***US 4,064,172*** ("**Dewdney (II)**") which is a divisional application of ***US 3,986,985***[1]. Favorable reconsideration of the Examiner's position and withdrawal of the respective rejection is respectfully solicited in light of the foregoing amendment and the following remarks.

The teaching of ***Dewdney et al.*** relates to a particular iron oxide catalyst for the hydrogenation of adipodinitril to hexamethylenediamine. More particularly, ***Dewdney et al.*** provide that the level of impurities can be controlled when the iron oxide catalyst is substantially free from haematite, and that the iron to oxygen ratio in

1) In the following, the designation ***Dewdney et al.*** is used collectively for "***Dewdney (I)***" and "***Dewdney (II)***" unless indicated otherwise.

the catalyst advantageously corresponds to a spinel structure[2]. Accordingly, ***Dewdney et al.*** prepare their catalyst preferably from naturally occurring magnetite ore, optionally adding iron or iron oxide to the ore to achieve an iron oxide content of the catalyst of not less than 96.5%. Naturally occurring iron ore in general, and magnetite ore in particular, however, comprises a broad variety of elements in varying amounts[3]. Those additional elements which are present in iron ores or magnetite ore are clearly not limited to

(b) 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium, and

(d) manganese, and optionally

(c) alkali and/or alkaline earth metals,

as required in accordance with applicants' invention as defined in the claims. Since applicants' invention requires not only that the active composition consists of iron or an iron compound and the constituents (b), (d) and optionally (c) but also requires particular amounts in which these special elements are present in the composition, the Examiner's position that applicants' mixture reads on the disclosure of ***Dewdney et al.*** is clearly no longer applicable. Also, the teaching of ***Dewdney et al.*** clearly contains nothing which would motivate a person of ordinary skill in the art to select specifically the additional elements which are defined in applicants' claims as constituents (b), (c) and (d), and to combine those specific constituents with iron or an iron compound in the particular amounts which are required in accordance with applicants' claims. The teaching of ***Dewdney et al.*** therefore cannot be considered to render applicants' invention as defined in the independent claims (*Claims 21,*

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2) corresponding to the structure of magnetite, chemical formula Fe_3O_4; for example ***Ullmann's*** Encyclopedia of Industrial Chemistry, 5th Ed., VCH Verlagsgesellschaft mbH (1989), pages 461-477 (copy enclosed), Table 3, page 465; note also the enclosed copies of:
- http://webmineral.com/data/magnetite.shtml, pp. 1-3 (03/20/2003);
- http://mineral.galeries.com/minerals/oxides/magnetit/magnetit.htm, p. 1 (03/20/2003);
- http://www.txf.net/a-z/m/magnetit.shtml, pp. 1-2 (03/20/2003); and
- ***Römpp*** Chemie Lexicon, 9th Ed., Georg Thieme Verlag, page 2600.

3) Concerning the composition of iron ores in general, note for example ***Ullmann's*** Encyclopedia (footnote (2)), Table 7 page 472; concerning the composition of magnetite ore note for example the enclosed copies of:
- ***Nyström et al.***, Economic Geology, 89, pp. 820-839 (1994), Table 1, page 829;
- http://www.iaea.org/programmes/nahunet/e4/nmrm/materials/sabs12.htm, page 1;
- http://www.techhistory.co.nz/pages/titanium.htm pages 1 to 3

33 and 41) prima facie obvious within the meaning of Section 103(a) and the same applies, mutatis mutandis, where the dependent claims are concerned[4]). Withdrawal of the rejection under Section 103(a) to the extent that it is based on the teaching of ***Dewdney et al.*** is, therefore, respectfully solicited.

Further, Claims 21 to 40 stand rejected under 35 U.S.C. §103(a) as being unpatentable in light of the teaching of ***Flick et al.*** (**US 5,527,946**). Favorable reconsideration of the Examiner's position and withdrawal of the respective rejection is respectfully solicited in light of the foregoing amendment and the following remarks.

The disclosure of ***Flick et al.*** relates to a catalyst wherein the catalytically effective composition is composed of

i) a compound based on a metal selected from the group of nickel, cobalt, *iron*, ruthenium and rhodium;

ii) from 0.01 to 25 wt.-%, based on (i), of a promoter based on a metal selected from palladium, platinum, iridium, osmium, iron, copper, silver, gold, chromium, molybdenum, tungsten, *manganese*, rhenium, zinc, cadmium, lead, *aluminum*, tin, phosphorus, arsenic, antimony, bismuth and rare earth metals; and

iii) from 0 to 5 wt.-%, based on (i), of a compound based on an alkali metal or an alkaline earth metal,

(*col. 1, indicated line 62, to col. 2, indicated line 13, of* **US 5,527,946**, *emphasis added*). ***Flick et al.*** neither suggest or imply the use of silicon, zirconium, titanium and/or vanadium in the active composition, and merely provides that porous oxides such as alumina, silica, aluminosilicates, lanthanum oxide, titanium dioxide, zirconium dioxide, magnesium dioxide, zinc oxide and zeolites may serve as carriers for the active composition (*col. 2, indicated lines 46 to 51, of* **US 5,527,946**). The teaching of ***Flick et al.*** therefore does not read on a composition which consists of iron or a compound based on iron and the specific additional elements which are defined in applicants' claims as constituents (b), (c) and (d) in the particular amounts which are required in accordance with applicants' claims. Furthermore, the teaching of ***Flick et al.*** contains nothing which would motivate a person of ordinary skill to select the promoter

4) If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

elements which characterize applicants' constituent (b) and to utilize them in the numbers and the amounts as required for applicants' constituent (b). The teaching of ***Flick et al.*** therefore cannot be taken to render the catalytic composition of applicants' claims which consists of

(a) iron or a compound based on iron or a mixture thereof,

(b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,

(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and

(d) from 0.001 to 1% by weight based on (a) of manganese,

prima facie obvious within the meaning of Section 103(a), and the same applies, mutatis mutandis, where the dependent claims are concerned[5]. Withdrawal of the rejection under Section 103(a) to the extent that it is based on the teaching of ***Flick et al.*** is, therefore, respectfully solicited.

Even when the teachings of ***Dewdney et al.*** and ***Flick et al.*** are considered in combination, or one is considered in view of the other, the prior art fails to suggest or imply the particular combination of elements which characterize the catalytically effective composition defined in applicants' claims, as both teachings fail to suggest or imply the selection of elements which is necessary to arrive at constituents (b) and (b) of applicants' composition, or the particular amounts in which those constituents are employed. The subject matter defined in the claims as herewith submitted is, therefore, patentable under the provisions of Section 103(a) in light of the teachings of ***Dewdney et al.*** and ***Flick et al.*** Favorable action is respectfully solicited.

REQUEST FOR EXTENSION OF TIME:

It is respectfully requested that a *three* month extension of time be granted in this case. A check for the *$930.00* fee is attached.

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5) see footnote (4)

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees to Deposit Account No. 11.0345. Please credit any excess fees to such deposit account.

Respectfully submitted,
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Encl.: THE LISTING OF CLAIMS (Appendix I)
THE AMENDED CLAIMS (Appendix II)
Ullmann's Encyclopedia of Industrial Chemistry, 5th Ed., VCH Verlagsgesellschaft mbH (1989), pages 461-477
http://webmineral.com/data/magnetite.shtml, pp. 1-3 (03/20/2003);
http://mineral.galeries.com/minerals/oxides/magnetit/magnetit.htm, p. 1 (03/20/2003)
http://www.txf.net/a-z/m/magnetit.shtml, pp. 1-2 (03/20/2003)
Römpp Chemie Lexicon, 9th Ed., Georg Thieme Verlag, page 2600
Nyström et al., Economic Geology, 89, pp. 820-839 (1994)
http://www.iaea.org/programmes/nahunet/e4/nmrm/materials/sabs12.htm, page 1
http://www.techhistory.co.nz/pages/titanium.htm pages 1 to 3

HBK/BAS

APPENDIX I:

THE LISTING OF CLAIMS (version with markings showing the changes made):

21. (*currently amended*) A hydrogenation catalyst comprising, as catalytically effective component, a composition consisting of

(a) iron or a compound based on iron or a mixture thereof,

(b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,

(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and

(d) from 0.001 to 1% by weight based on (a) of manganese.

22. (*currently amended*) The catalyst defined in claim 21, [~~which~~] wherein the catalytically effective component is obtained by reduction with or without subsequent passivation of a magnetite.

23. (*currently amended*) The catalyst defined in claim 21, [~~which~~] wherein the catalytically effective component is obtained by precipitating precursors of [~~said components~~] constituents (a), (b), (d) and optionally (c) in the presence or absence of support materials.

24. (*currently amended*) The catalyst defined in claim 21, which is obtained by impregnating a support with a solution of [~~said components~~] constituents (a), (b), (d) and optionally (c).

25. (*currently amended*) The catalyst defined in claim 21, which is obtained by spraying [~~said components~~] constituents (a), (b), (d) and optionally (c) onto a support.

26. (*previously added*) The catalyst defined in claim 21, which has a BET surface area of from 3 to 20 m^2/g, a total pore volume of from 0.05 to 0.2 mL/g, an average pore diameter of from 0.03 to 0.1 μm and a 0.01 to 0.1 μm pore volume fraction within the range from 50 to 70%.

27. (*currently amended*) The catalyst defined in claim 21, wherein [~~component~~] the promoter elements (b) [~~is based on~~] are selected from aluminum, silicon and titanium.

28. (*currently amended*) The catalyst defined in claim 21, wherein [~~component~~] constituent (c) is based on magnesium and/or calcium.

29. (*currently amended*) The catalyst defined in claim 21, wherein [~~component~~] constituent (c) is present in an amount of from 0.01 to 0.2% by weight based on (a).

30. (*currently amended*) The catalyst defined in claim 21, wherein [~~component~~] constituent (c) is present in an amount of from 0.01 to 0.1% by weight based on (a).

31. (*currently amended*) The catalyst defined in claim 21, wherein [~~component~~] constituent (d) is present in an amount of from 0.001 to 0.3% by weight based on (a).

32. (*currently amended*) The catalyst defined in claim 21, wherein [~~component~~] constituent (d) is present in an amount of from 0.01 to 0.2% by weight based on (a).

33. (*currently amended*) A hydrogenation catalyst consisting essentially of a catalytically effective component and a support material, wherein the catalytically effective component is a composition consisting of

(a) iron or a compound based on iron or a mixture thereof,

(b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,

(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and

(d) from 0.001 to 1% by weight based on (a) of manganese.

34. (*currently amended*) The catalyst defined in claim 33, [~~which~~] wherein the catalytically effective component is obtained by reduction with or without subsequent passivation of a magnetite.

35. (*currently amended*) The catalyst defined in claim 33, which is obtained by precipitating precursors of [~~said components~~] constituents (a), (b), (d) and optionally (c) in the presence [~~or absence~~] of the support materials.

36. (*currently amended*) The catalyst defined in claim 33, which is obtained by impregnating [~~a~~] the support with a solution of [~~said components~~] constituents (a), (b), (d) and optionally (c).

37. (*currently amended*) The catalyst defined in claim 33, which is obtained by spraying [~~said components~~] constituents (a), (b), (d) and optionally (c) onto [~~a~~] the support.

38. (*previously added*) The catalyst defined in claim 33, which has a BET surface area of from 3 to 20 m^2/g, a total pore volume of from 0.05 to 0.2 mL/g, an average pore diameter of from 0.03 to 0.1 μm and a 0.01 to 0.1 μm pore volume fraction within the range from 50 to 70%.

39. (*currently amended*) The catalyst defined in claim 33, wherein [~~component~~] constituent (c) is present in an amount of from 0.01 to 0.2% by weight based on (a).

40. (*currently amended*) The catalyst defined in claim 33, wherein [~~component~~] constituent (d) is present in an amount of from 0.001 to 0.3% by weight based on (a).

41. (*new*) A catalytically effective composition consisting of

(a) iron or a compound based on iron or a mixture thereof,

(b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,

(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and

(d) from 0.001 to 1% by weight based on (a) of manganese.

42. (*new*) The composition defined in claim 41, which is obtained by reduction with or without subsequent passivation of a magnetite.

43. (*new*) The composition defined in claim 41, wherein the promoter elements (b) are selected from aluminum, silicon and titanium.

44. (*new*) The composition defined in claim 41, wherein constituent (c) is based on magnesium and/or calcium.

45. (*new*) The composition defined in claim 41, wherein constituent (c) is present in an amount of from 0.01 to 0.2% by weight based on (a).

46. (*new*) The composition defined in claim 41, wherein constituent (c) is present in an amount of from 0.01 to 0.1% by weight based on (a).

47. (*new*) The composition defined in claim 41, wherein constituent (d) is present in an amount of from 0.001 to 0.3% by weight based on (a).

48. (*new*) The composition defined in claim 41, wherein constituent (d) is present in an amount of from 0.01 to 0.2% by weight based on (a).